Panel PC

PPC-ARM

User Manual

Copyright

This publication contains information that is protected by copyright. No part of it may be reproduced in any form or by any means or used to make any transformation adaptation without the prior written permission from the copyright holders.

This publication is provided for informational purposes only. The manufacturer makes no representations or warranties with respect to the contents or use of this manual and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. The user will assume the entire risk of the use or the results of the use of this document. Further, the manufacturer reserves the right to revise this publication and make changes to its contents at any time, without obligation to notify any person or entity of such revisions or changes.

© 2011. All Rights Reserved.

Trademarks

All trademarks and registered trademarks of products appearing in this manual are the properties of their respective holders.

FCC and DOC Statement on Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice:
1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

2

Warranty

1. Warranty does not cover damages or failures that are raised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.
2. The warranty is void if the product has been subject to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.
3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.
4. We will not be liable for any indirect, special, incidental or consequential damages to the product that has been modified or altered.

Static Electricity Precautions

It is quite easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.

Important:
Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

3

Safety Measures

To avoid damage to the system:
• Use the correct AC input voltage range should an external AC/DC adaptor is employed.

To reduce the risk of electric shock:
• Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

Battery:
• Danger of explosion if battery incorrectly replaced.
• Replace only with the same or equivalent type recommend by the manufacturer.
• Dispose of used batteries according to local ordinance.

Before Using the System

Before using the system, prepare basic system components.

If the system comes as a barebone; that is, none of the key components, including processor, memory, and hard drive has been pre-installed as part of your purchase, you will need to at least ensure a compatible counterpart is located and installed.

You will also need a few external system peripherals intended for the use of the system, a common pool with at least a keyboard, a mouse, and a monitor is thus suggested.

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 │ FAX: +886-3-324-9777 │ EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

4

Table of Content

Chapter 1 General Information

Chapter 2 Jumper Setting

Chapter 3 Android Software Access

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)

TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

5

Chapter 1
General Information

BESTEK
Always at the forefront of innovation

1.1 Main Feature

ARM®-Based Panel PC

PPC-ARM is a general purpose ARM®-Based Panel PC with Freescale i.MX6 Dual/Quad Core 1GHz Processor, 1GB DDR3 Memory, 4GB eMMC as onboard storage, and a wide variety sizes of panel and touch from 10.1" to 21.5", suggesting scalable customization for users to maximize the application coverage.

Outstanding Freescale i.MX6 Graphic Performance

The i.MX6 processors are designed for next-generation consumer, industrial, and automotive applications. The power-efficient processing capabilities of the ARM Cortex-A9 architecture with outstanding 3D and 2D graphics, as well as high-definition video, create a new level of multimedia performance to enable an unlimited next-generation user experience, especially over Android in which some smooth graphic performance against user's touch triggering is demanded.

Fanless With Inherent Low Power Consumption

The extremely low power consumption from i.MX6 processor benefits from the fanless nature of the built-in embedded board, that being propagated to the design of PPC-ARM, minimizes the system slimness with greater endurance against higher average environment temperature and more spatial limitation. Such a nature also suggests no operation noise, a level that any noise-critical application would bear to put up with.

List of Key Features

- Freescale iMX6 Dual-Lite ARM® Cortex™-A9 Processor
- 10.1" ~ 21.5" Full Range Panel Size
- Full Flat P-CAP Multi Touch Panel
- Fanless & Low Power Consumption
- Internal WiFi+ BT Module On Request
- Slim and Compact Metal Housing
- Onboard 4GB eMMC with Android 4.4

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

7

1.2 Specifications

System	Motherboard	BNX-FMX3					
	Process	Freescale ARM® Cortex™-A9 Dual-Lite 1GB Processor(Default)					
		Freescale ARM® Cortex™-A9 Quad-Core 1GB Processor(Option)					
	Memory	Onboard 1GB DDR3 1066MHz					
	Operation System	Android 4.4 (Default) / Ubuntu 12.04 (Optional)					
Display	Size/Type	10.4"	12.1"	15"	10.1"	15.6"	21.5"
	Resolution	1024x768	1024x768	1024x768	1280x800	1366x768	1920x1080
		4:3			16:9		
	Brightness(cd/m^2)	350	350	300	350	300	250
	Touch interface	P-CAP touch					
Storage	eMMC	Onboard 4GB eMMC					
	SD	Micro-SD Card Slot					
Connectivity	Communication	10/100/1000 Mbps					
		802.11a/b/g/n, Bluetooth, 3G / 4G module (Optional)					
	I/O	1x Power Switch with LED indicator, 1x DC-in Jack, 1x Line-out, 1x Mic-in, 1x HDMI 1x VGA (Optional), 1x RJ45 LAN, 2x USB 2.0, 1x Micro-USB OTG, 1x RS232(Optional) 2x 8Ω/1W Speaker, 1x RF Antenna, 1x 3G/4G Antenna					
Power	Input	12Vdc Power-In / 100-240Vac, 50-60Hz					
	Consumption	15W					
Environment	Operating Temp.	0ºC to 50ºC					
	Storage Temp.	-20ºC to 60ºC					
	Humidity	10% to 90% (Operating, non-condensing)					

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

8
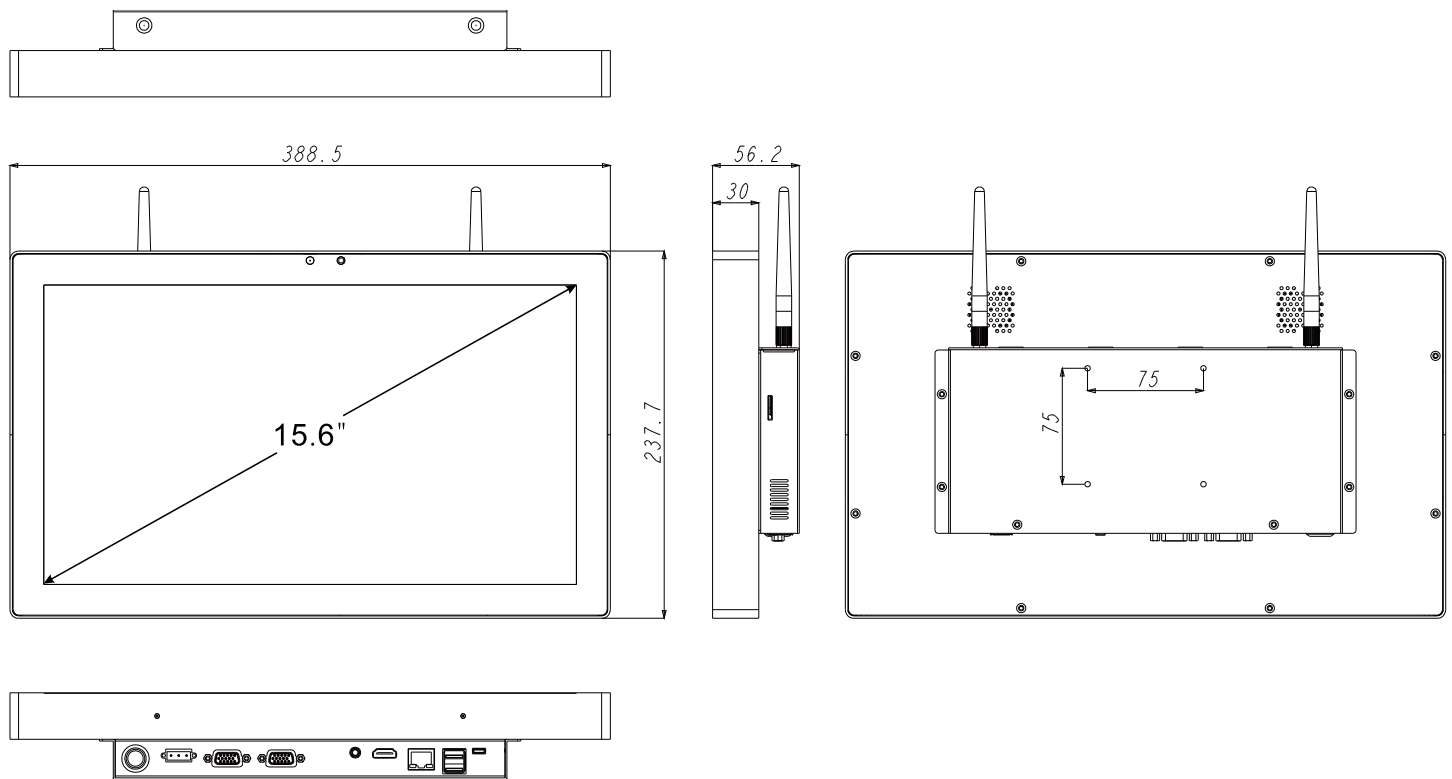
1.3　System Layout

Figure 1.1: System Layout of PPC-ARM

BESTEK
Always at the forefront of innovation
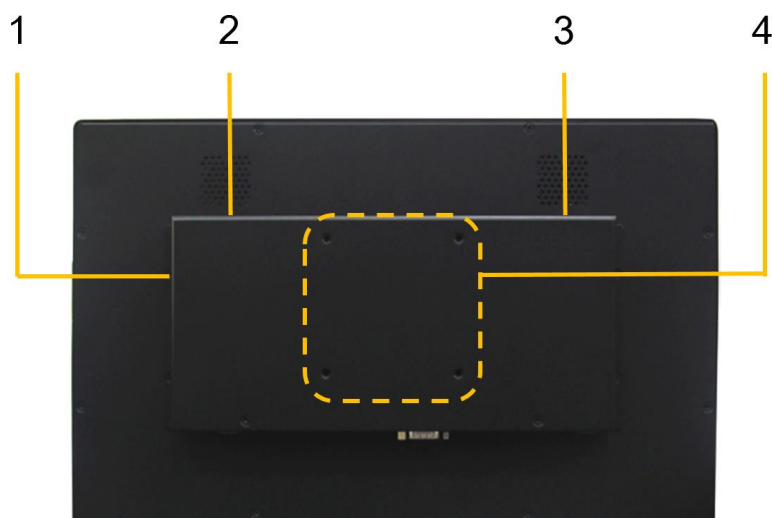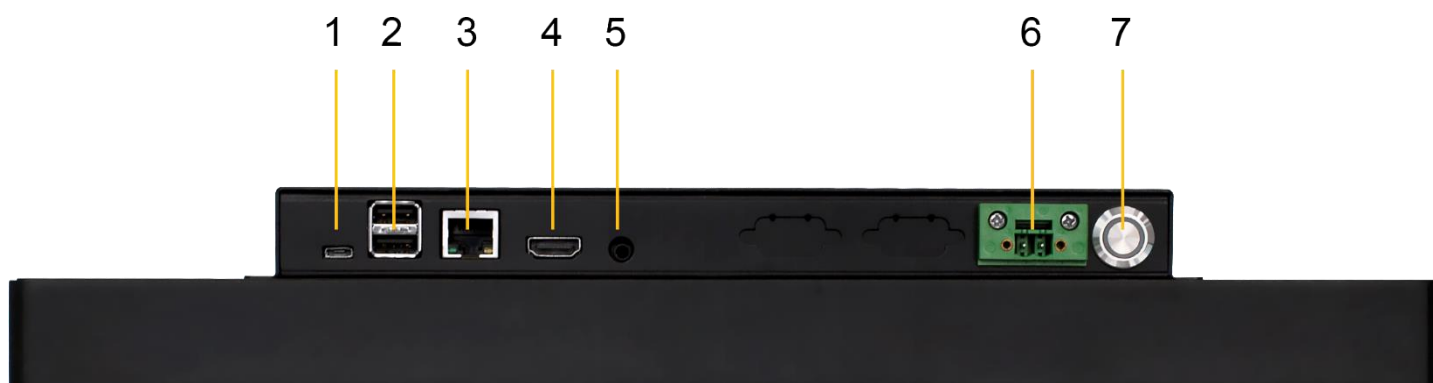
1.4 Indicators & Features

►**Front View**
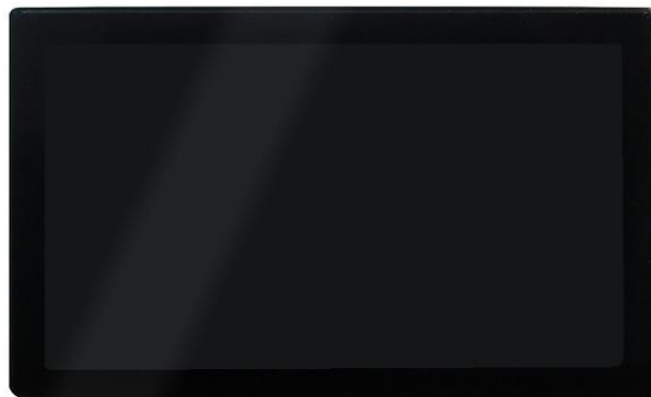
Full Flat P-CAP Touch Screen

►**Rear View**

1. Micro-SD Slot
2. WiFi / Bluetooth Antenna Cutout
3. 3G/4G Antenna Cutout
4. Standard VESA Mount (75x75mm)

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 │ FAX: +886-3-324-9777 │ EMAIL: sales@bestek-tp.com.tw

10

1.5 Back Panel Connectors

1. USB OTG Port
2. 2* USB 2.0
3. 10/100/1000 Ethernet
4. HDMI
5. Audio Output
6. 12V DC-in Phoenix Connector
7. Power Switch

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

11

Chapter 2
Preparation

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

12

2.1   Before You Begin

A stable and clean working environment are essential. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.
Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A set of jewelers Screwdrivers
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environment tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

2.2   Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on the computers that are still connected to a power supply can be extremely dangerous. Follow the guidelines below to avoid damage to your computer or yourself:

- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Never touch the components on the board unless it is necessary to do so. Do not flex or stress the circuit board.
- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- Use correct screws and do not over tighten screws.

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

13

2.3   Open Up Back Cover

In case a particular cable, switch, or module is out of order, a replacement or proper adjustment upon the integrated parts may be required. To access all these integrated parts within PPC-ARM, you need to open up the back cover first. To do so, please make sure the cautious reminder in section 2.1 has been seriously taken into account prior to any further step below.

Turn your PPC-ARM upside down, that is, placing the panel side on the table. *It is not necessary to open up the back cover if it is to add/remove/swap a Micro-SD card. The Micro-SD slot can be found on the side of this back cover. Please refer to the Micro-SD Card section for details.*

Remove the 6 screws as indicated in the places below, prior to any moving of the back cover. It is necessary to push the lower side (the side attached to I/O connectors) upwards, then pull this back cover out of the place.

Securing all the screws is essential for they would be re-used for the restoration of the back cover, after all preparation procedures are completed.

Remove the 6 screws   Life up the side of arrow (this side up first)
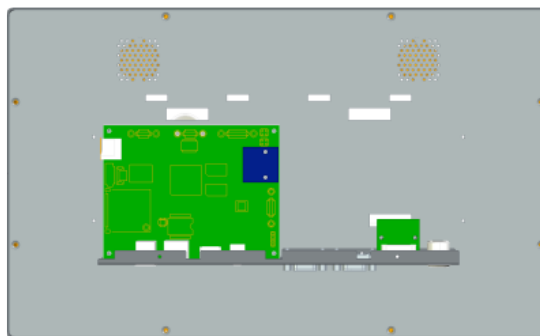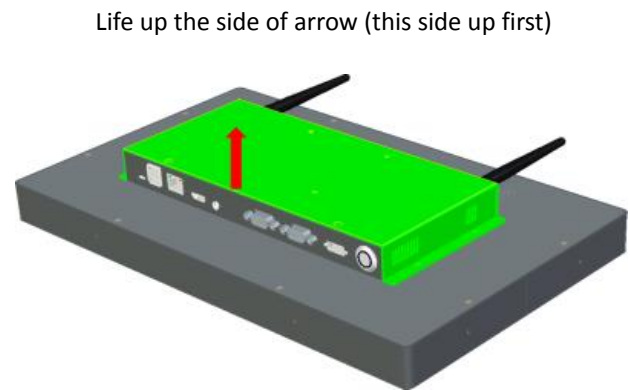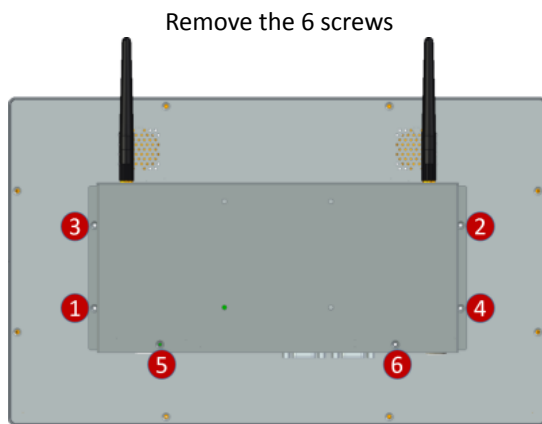
Please be advised that, if the unit comes to you with wireless module installed and the antenna (1 or 2 of them) mounted, the antenna is actually attached directly to the back cover (as in the picture above), while the antenna cables are connected on the internal wireless module. It is our job to remind you of the existence of both parts and special carefulness is to be expected while taking the back cover off the unit, where the antenna cable might be damaged by inadvertent handling of this back cover. To avoid breaking off the cable, after the back cover is lifted up, please make sure the antenna cable is detached from the wireless module before the back cover is moved away.

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

14

2.4　Internal Connectors

Power Input Phoenix Connector

Pin	Definition	Pin	Definition
1	V-	2	V+

Type-A USB 2.0

Pin	Definition	Pin	Definition
1	Vcc (5V)	2	D-
3	D+	4	GND

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

15

RJ45 LAN Connector
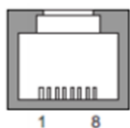
Pin	Definition	Pin	Definition
1	TX+	2	TX-
3	RX+	4	NC
5	NC	6	RX-
7	NC	8	NC

DB9 RS-232 Connector (Optional)
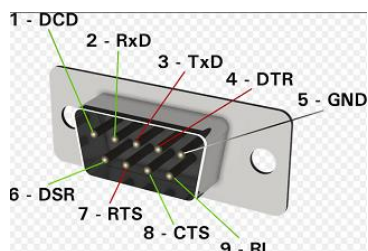
Pin	Definition	Pin	Definition
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

1 - DCD
2 - RxD
3 - TxD
4 - DTR
5 - GND
6 - DSR
7 - RTS
8 - CTS
9 - RI

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

16
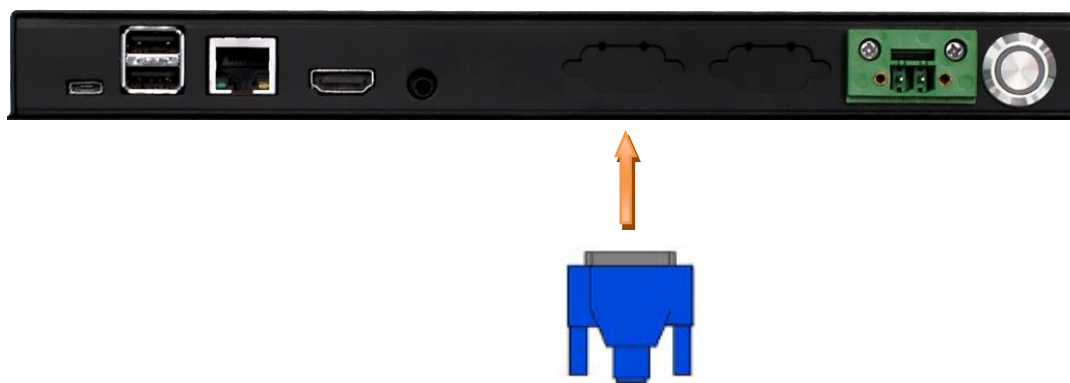
VGA (Optional)
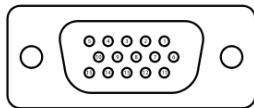
Pin	Definition	Pin	Definition
1	RED	2	GREEN
3	BLUE	4	ID2/RES
5	GND	6	RED_RTN
7	GREEN_RTN	8	BLUE_RTN
9	KEY/PWR	10	GND
11	ID0/RES	12	ID1/SDA
13	HSync	14	VSync
15	ID3/SCL		
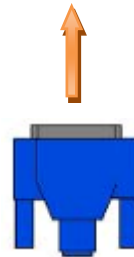
HDMI
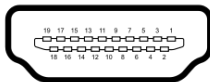
Pin	Definition	Pin	Definition
1	TMDS data 2+	11	TMDS clock Shield
2	TMDS data 2 Shield	12	TMDS clock-
3	TMDS data 2-	13	CEC
4	TMDS data 1+	14	NC
5	TMDS data 1 Shield	15	DDC clock
6	TMDS data 1-	16	DDC data
7	TMDS data 0+	17	Ground
8	TMDS data 0 Shield	18	+5V Power
9	TMDS data 0-	19	Hot Plug Detect
10	TMDS clock +		

BESTEK
Always at the forefront of innovation

OTG

1: VCC
2: RX
3: TX
4: NC
5: GND
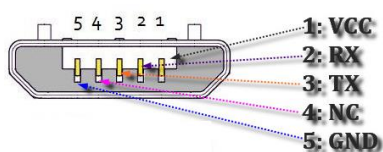
Pin	Definition	Pin	Definition
1	VCC	2	RX
3	TX	4	NC
5	GND		

Audio

Power Switch

BESTEK
Always at the forefront of innovation

Chapter 3
Android
Software Access

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL:+886-3-324-9700 | FAX:+886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

19

3.1   Preparing Tools

Some hardware and software are to be prepared before further jobs are proceeded.

Hardware Requirement:

1. 1* Windows PC: NB (Notebook) or Desktop PC, Windows-Based.
2. 1* USB Type-A to micro USB cable

Software Requirement:

1. Platform-tools
2. AdbDriverInstaller.exe
3. Image Files

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

20

3.2   Loading OTG Driver

Knowing how to connecting PPC-ARM with a Windows computer (Compatible Windows would be any of Windows-XP/7/8, 32/64bit) is essential. Most users would use the onboard eMMC as their primary OS storage, leaving the Micro-SD as the media for data recording or exchange. As eMMC is mounted on the board, using USB OTG port has become the standard and the only approach to upload a new or refurbished image file onto eMMC. However, if a user chooses to use Micro-SD as the primary OS storage, Micro-SD card can be removed from the card slot, and the image file can be replaced by using image writer tool running on Windows. This part is subject to the software being used as the image writer, and is not covered in this user's manual as process might vary.

Please refer to the following procedure to activate OTG port.

1. Connect the OTG port of PPC-ARM to any USB port of one Windows computer.
2. Turn on PPC-ARM
3. Execute this tool (AdbDriverInstaller.exe) on Windows:

AdbDriverInstall
er.exe
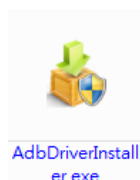
4. Windows will automatically detect PPC-ARM and produce a list with "Android Composite ADB Interface" as below. Please click on it to select it, and press "Install" to start driver installation.

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw
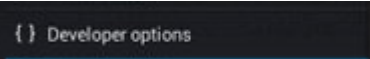
21
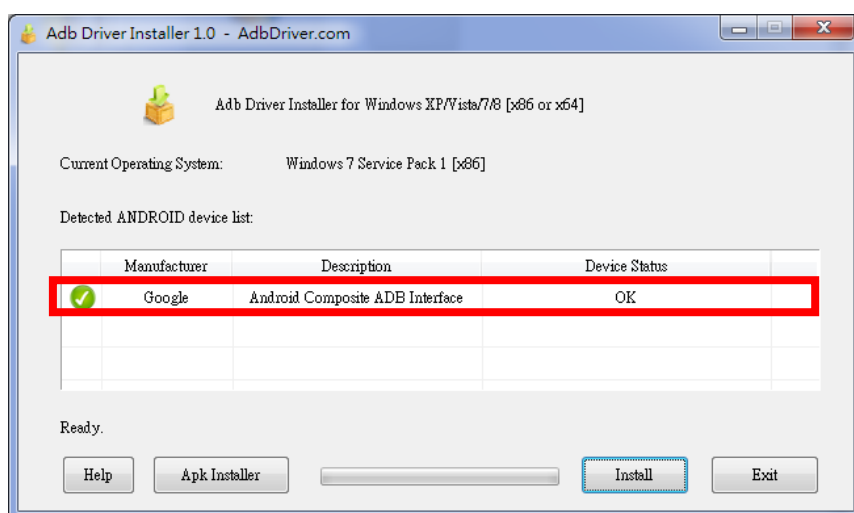
3.3   Open USB Debug Port

USB Debug Port needs to be activated within Android prior to any debugging or software session. *It is assumed that the OTG driver in Section 3.1 has been loaded.*

1. Turn on the power of PPC-ARM. Once Android desktop is available to your operation, find the setting icon and Click on it.

2. Find on the left side of the pane "about Tablet" as

    ⓘ About tablet

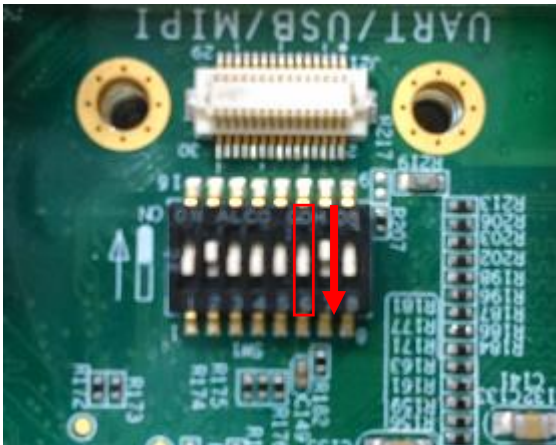3. Make 5~10 times of quick clicks on "Build Number" until "Developer options" shows at Left side.

    { } Developer options

4. Click on "Developer options "
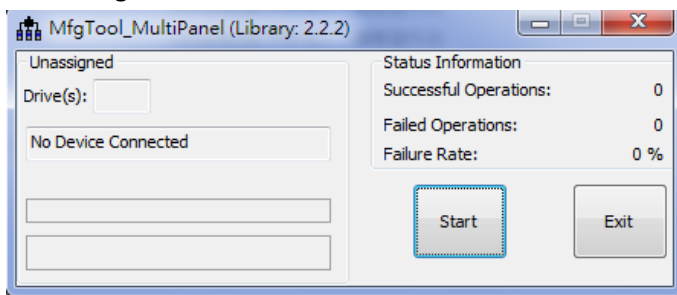
5. Select "USB debugging" as

    USB debugging
    Debug mode when USB is connected   ✔

6. Click "OK" to open USB debug port

7. Hereby it is assumed that the back cover of PPC-ARM has been removed. Find the switch panel as below.

8. Please move the switch No.6 to OFF position.

9. Connect PPC-ARM with a Windows PC via USB OTG port.

10. Turn on PPC-ARM.

11. Open "Image Files" file on Windows PC.

No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

BESTEK
Always at the forefront of innovation

22

12. Click "MfgTool2.exe" until device is connected.

13. Click "Start" to Upgrade Image and waiting for 4~5 minutes.

14. When finish software upgrade, click "stop ".

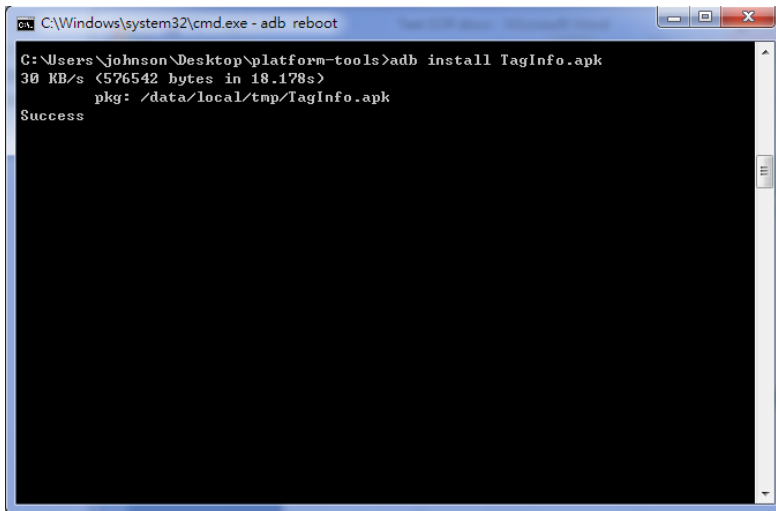15. Remove PPC-ARM adapter to shut it down, and move switch NO.6 to ON position.
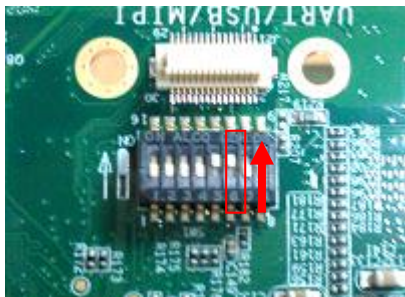
16. Restore the back cover.

4.4 Installing APP

This is to show how to upload a ".apk" file of a specific APP onto the Android platform.

1. Move over to Windows PC, bring up command mode
2. Bring up "platform-tools" folder
3. Give this command: `adb install XXX.apk`
4. Within a few seconds, a message "`Success`" will pop up, indicating the installation is successful.

5. On completion, an icon will be available on Android desktop.